

SAR to the rescue: Search and rescue group uses Sandia synthetic aperture radar to save stranded hiker

By Chris Burroughs

A Sandia radar, originally developed for military surveillance and reconnaissance applications, is helping a local volunteer search and rescue group save lives.

The Rapid Terrain Visualization (RTV) precision mapping synthetic aperture radar (SAR) was used for the first time last November by the Albuquerque Mountain Rescue Council (AMRC) to help find and rescue a hiker stranded in the dark in the Sandia Mountains.

It all started with a conversation between Dale Dubbert of SAR Sensor Technologies Dept. 2345, a former rescue council volunteer, and Steve Attaway (9134), long-time group member.

"We talked about Sandia's capabilities to do precision terrain maps and realized that this technology could be useful in search and rescue missions," Dale says. "It had the potential of providing detailed information about terrain where searches are underway, including heights, location of crevices and cliffs, and even different types of vegetation."

The RTV mapping system uses interferometric synthetic aperture radar (IFSAR). Two antennae offset in elevation aboard a moving aircraft allow the measurement of target height, as well as east-west and north-south position like conventional SAR. This produces a 3-D map that shows terrain details.

(Continued on page 4)



SAR FOR SAR — Bill Scherzinger (9123), president of the Albuquerque Mountain Rescue Council, looks at a SAR map and a standard topographic map used in search and rescue missions. (Photo by Randy Montoya)

KAFB offers Sandians use of its Mountain View Club facilities

Aug. 19 meeting to discuss this alternative to Coronado Club

By Michael Padilla

The Mountain View Club — once known as the Officers Club — will soon be home to many Coronado Club members, thanks to the offering by Kirtland Air Force Base (KAFB) service representatives.

An information meeting to discuss membership in the Mountain View Club and other KAFB services offered to Sandians will be held Thursday, Aug. 19, at noon in the Steve Schiff Auditorium. The meeting is open to all Sandians and retirees.

Sandia announced in May that its aging Coronado Club, which has served Sandians for 54 years, will close permanently on Oct. 1 (*Lab News*, May 28).

"The Air Force has been generous in allowing Sandians the opportunity to take advantage of the Mountain View Club facilities. Sandia employees and retirees are fortunate to be offered the chance to be a part of the Mountain View Club at a comparable cost to what Coronado Club members pay now," says Larry Clevenger, Director of Sandia's Benefits and Health Services.

The Mountain View Club is located on the east side of KAFB in Bldg. 22000 on Club Road.

The Mountain View Club offers Sandians lunch, dining, Sunday brunch, and full-service catering for private functions. Special programs include dinner specials, theme nights, live entertainment, and dancing. The club also houses two lounges that can also be reserved for private parties.

(Continued on page 4)

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Real New Age crystal: Sandia's John Reno fabricates the best terahertz crystals in US

Sandia thin-films used for high-tech detectors and lasers

By Neal Singer

The relatively unexplored terahertz frequency range — higher than microwaves, lower than the far infrared — has long intrigued researchers.

Lasers and detectors in the THz frequency regime have wide-ranging applications in spectroscopy, astronomy, medical and other types of imaging, and in remote sensing. They are expected to be useful in chemical sensing systems for the detection of molecular absorption lines associated with trace gases.

While lasers with detectors already exist to send and receive signals from that realm, commercial lasers weigh hundreds of pounds, contain long fragile glass tubes, and cost a lot of money, says Jerry Simmons, Manager of Sandia's Semiconductor Materials & Device Sciences Department (1123).

What's wanted are lightweight, inexpensive, robust devices. Such devices are now appearing. Their generating sources are semiconductor crystal films.

Perhaps surprisingly, the very best crystal films for terahertz work in the US are made on a 10-year-old molecular beam epitaxy machine in

Sandia's aging Compound Semiconductor Research Lab.

Credit, many agree, goes to the expert hand of John Reno (1123).

Sandia is the best and (until very recently, through a transfer of Sandia technology) the only place in the US to grow a crystal film that can be made into such lasers and sensors.

One difference between the older, clunkier lasers and modern attempts at penetrating the terahertz range are obvious. Instead of requiring the space of a table top, THz lasers from crystals grown by John are smaller than a cubic millimeter.

Achieving a laser that operates close to room temperature is still an issue. Currently the highest operating temperature — 130K — has been achieved by Professor Qing Hu at MIT, using crystals grown at Sandia. While the required cooling system for this device is bigger than a cubic millimeter, the overall size is still small compared to the older lasers.

Mike Wanke (1743) at Sandia is developing a terahertz semiconductor laser that should be easier and cheaper to maintain than the MIT ver-

(Continued on page 5)

California graduate student uses PDAs to monitor patient nutrition

3

US-Russian accord calls for more global use of nuclear energy

5



6

Sandia rocket sled track zooms through its first 50 years

8

Spaced-out Sandia stores square feet in 'space bank'

This & That

Recycled columnist – It's me, Larry Perrine, back for another one-time return engagement as *Lab News* columnist; I filled this valuable space 1989-2001, and I'm subbing this issue for the vacationing Howard Kercheval, back visiting in his native Kentucky. I hope we don't have to dry him out from overindulgence in sampling the "indigenous liquid goods" there.

Before leaving, ol' Howie mumbled something about visiting a new lady friend there; maybe he'll report in the next issue about how well it went, or maybe he won't return at all if they hit it off big time. Maybe I'll get this column-writing job back regularly; it certainly beats working.

* * *

How well do we know him? – Sandia President C. Paul Robinson has been using the "C." as part of his formal name for quite a while now, but I'll bet few of us have a clue what the C stands for. (You think Clyde, Clem, or maybe Chester?) While we're pondering that, how many of us know what C.'s favorite hobbies are (assuming he ever has time to pursue them)? You think he likes to knit? Breed pit bulls? Grow prize begonias? Tango? Read sleazy romance novels? Play big-money bingo? I'm sure Howie (a frustrated investigative reporter at heart) will dig right into this and report on it in the next issue. (I would have, but I had to go on vacation this week.)

* * *

Semi-retired? – As a walk-on single golfer at an Albuquerque course several weeks ago, I was grouped with a bunch of geezers who turned out to be Sandia retirees of 10 years or more. One asked if I were also retired. "Semi-retired since this spring," I said. "Now what the devil does semi-retired mean?" another one asked. I said – with a straight face – it means I go in late every day, leave early, and don't work very hard when I'm here. I got a couple of "you-lazy-slacker" looks until I could no longer suppress a smile, then "fessed up" that I now work only three days a week – Monday through Wednesday – giving me four days off in a row.

Seriously for a minute . . . Sandia's part-time work option is a nice benefit to consider if you are thinking about retiring, but aren't ready to do it "cold turkey." (Approval is subject to your new schedule meeting the Labs' needs and your managers' blessings.) You may suffer snide comments from colleagues as I do: "You're working three days a week now. Isn't that more than you worked before?" But I get even when leaving every Wednesday afternoon and saying in full voice, "See you in four days."

* * *

Mini-editorials – Because I get this space only every blue moon, I want to take advantage to voice my valued opinion in several mini-editorials: Hang up and drive. Use your turn signals. Pull ALL the way up to the parking bumper. One especially for the young: If you little pukers must play your car stereos at eardrum-busting volume, roll up your windows! And finally to all "celebrities" of all parties: Keep your political opinions to yourselves; I don't care who you support and I certainly won't make up my mind about any issue or any candidate based on what you think!

* * *

Training time – Gotta go take that required drug-free workplace training. Too many people are convinced I'm on something.

Larry Perrine (845-8511, MS 0165, lgperri@sandia.gov)

Standdown affects all employees, halts some operations

Sandians have been working under the constraints of a DOE-mandated complex-wide standdown since Monday a week ago. The standdown is of operations that use classified removable electronic media (CREM) — removable computer disks of any size, laptops, and other removable electronic storage media. But all Q-cleared and L-cleared employees, regardless whether they handle classified matter, were affected to some degree.

DOE headquarters directed a standdown at each site on July 23.

Sandia President and Labs Director C. Paul Robinson announced the Sandia standdown in a phone message to all employees July 26, effective that day. He said it would continue "until certain precautions and actions have been taken."

A number of employees worked over that previous weekend planning the standdown and preparing briefing materials. Work that did not make use of CREM continued, but a number of important core Sandia programs that require their use were halted.

All employees were to receive, at a minimum, a briefing from their managers on proper procedures in handling CREM. Those who handle classified removable media had an extensive litany of tasks, and document specialists began a comprehensive inventory of their CREM holdings.

"I hope we can all use this standdown to discuss the best improvements and get them under way to improve our own record and protect us against a major disaster in the future," Paul said in his telephone message to employees.

"I'm asking, as always, that Sandians give it your best efforts," Paul said. "We have the responsibility to control our classified matter, and everyone is looking on us to succeed."

Employee death

Bill Hanson of Neutron Generators Value Stream Dept. 14401 died June 29.

He was 48 years old.

Bill was a technical team leader and had been at Sandia since April 1979.

He is survived by his wife Vivian and daughter Erin.

Retiree deaths

Carlton E. Sisson (age 70)	June 1
Roger P. Anderson (85)	June 3
Andrew T. Kersey (80)	June 5
Ray J. Beall (74)	June 5

Sandia LabNews

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LOCKHEED MARTIN

Sandia Technology, Lab News win 2004 APEX grand awards; 28 others honored

Sandia Technology (Sandia's quarterly research and development journal) and the *Lab News* each won a Grand Award in the 16th annual Awards for Publications Excellence (APEX 2004) national competition for communications professionals, announced July 8.

This means Sandia received two of the 100 APEX Grand Awards presented in 11 major categories. There were 5,462 entries to the competition.

Sandia Technology was honored for its special issue on homeland security (Vol. 5 No. 2). Chris Burroughs, Nancy Garcia, Neal Singer, John German, and Michael Janes did the writing. Randy Montoya, Bud Pelletier, and Bill Doty did the photography. Douglas Prout (Technically Write) did the design. Will Keener edits.

The *Lab News* was honored for its Sept. 5, 2003, issue, whose lead article by Michael Padilla was on Sandia's role in analyzing the causes of the space shuttle *Columbia* accident. The award goes to all *Lab News* staff members.

* * *

In addition to the two Grand Awards, Sandia communicators received 28 APEX Awards of Excellence. Two of the awards were to photogra-

pher Randy Montoya. Randy has now won at least one APEX award for 10 consecutive years.

Another two-award winner this year was Iris Aboytes, honored in the category feature writing for her *Lab News* story "Sandian Brings Renewable Energy to Mexico and South America" and in health and medical writing for her *Lab News* story "Yoplait Names Sandian 'Champion' in the Fight Against Breast Cancer."

Janet Carpenter, Bill Murphy, and Patrick Milligan also won two solo Awards of Excellence.

Other Awards of Excellence went to Howard Kercheval, John German, Doug Prout and Will Keener (jointly), Larry Perrine and

Michael Vittitow (jointly), Michael Clough, Neal Singer, John German and Michael Padilla (jointly), Chris Burroughs, Jerry Gorman, Sherri Mostaghni, Julie Hall and Daniel Strong (jointly for the redesigned Combustion Research Facility newsletter in California), a joint award to Will Keener, Pat Milligan, and Jerry Gorman for the 2004 Sandia calendar, Noel Fletcher, Reeta Garber, Kara Madden, the WebCo Team 8524 in California, Mitzie Bower, and Steve Pope.

For details on the APEX competition and all awards, see the web site www.apexawards.com.



Sophia Lefantzi to participate in NAE 'Frontiers' symposium

Sandia's Sophia Lefantzi is one of 86 of the nation's brightest young engineers selected to participate in the National Academy of Engineering's (NAE) 10th annual Frontiers of Engineering symposium. The three-day event will bring together engineers ages 30 to 45 who are performing cutting-edge research and technical work in a variety of fields. They were nominated by fellow engineers or organizations. NAE President William Wulf says the goal is to expose engineers "to ideas outside of their specialties to spark new insights and collaborations."

The symposium will be held Sept. 9-11 at the National Academies' Beckman Center in Irvine, Calif.

Sophia is a limited term technical staff member in Reacting Flow Research Dept. 8351, holding a dual role with the Scalable Computing R&D Dept. 8961.

"I'm really proud of the work I'm doing here," Sophia says. Her team is using the Common Component Architecture, developed by the Center for Component Technology for Terascale Simulation, to create a toolkit for simulating flames accurately at modest computational costs.

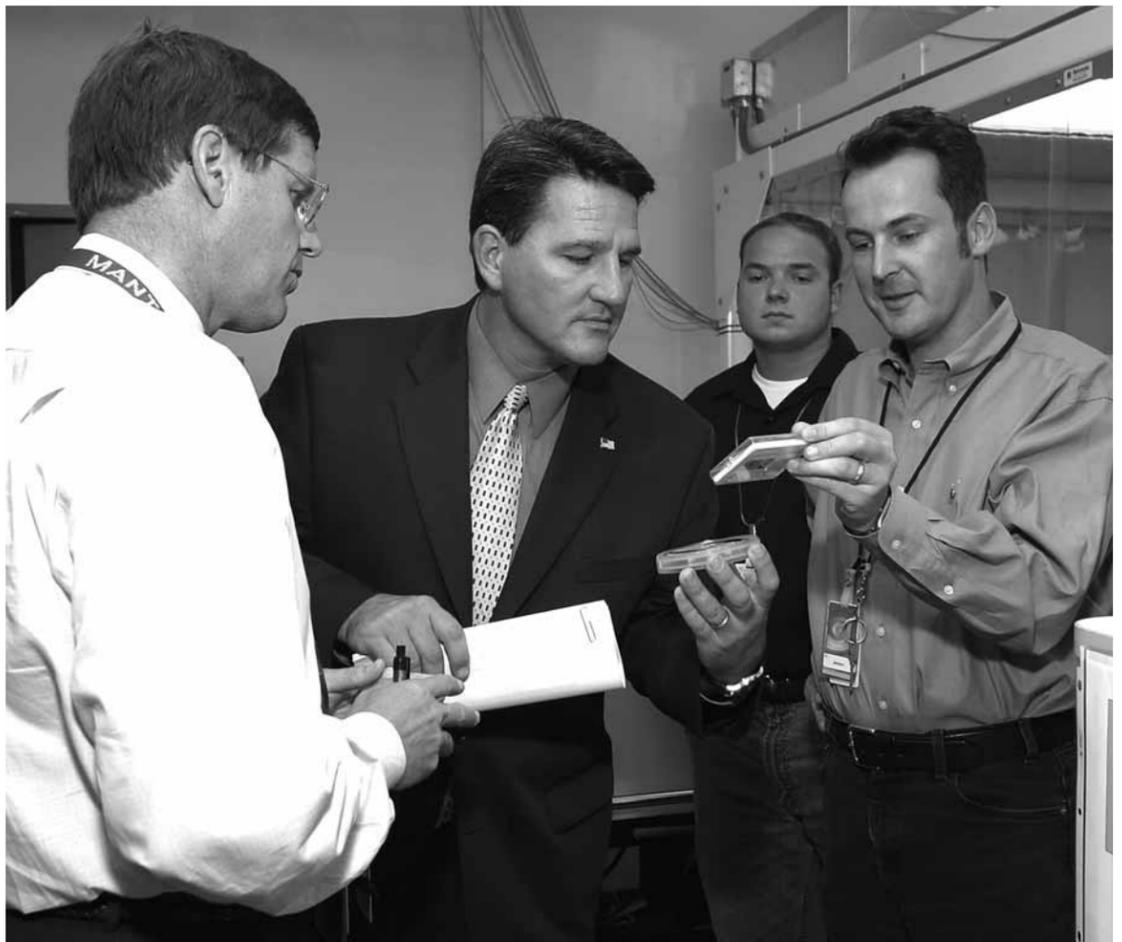
The toolkit incorporates techniques developed by Sandia's Computational Facility for Reacting Flow Science group and nine other labs and universities. Its modules can be used for commonly recurring mathematical problems by various scientific computing groups. The efforts are funded by DOE's Scientific Discovery through Advanced Computing program.

About the symposium, she says, "It's a big honor. I'm really excited."

The NAE says Sandia's Grant Heffelfinger (1802) helped organize this year's event.

Sandia CaliforniaNews

New NNSA principal deputy administrator tours Sandia/Calif. weapons, bioscience, materials areas



NNSA VISIT — Microsystems Science & Technology 8750 Deputy Director Glenn Kubiak, left, assisted a tour for Jerald S. Paul, center, new principal deputy administrator of the National Nuclear Security Administration. At right, Georg Aigeldinger (8753) describes LIGA metrology while Joseph Ceremuga (8753) looks on in the background. Paul visited Sandia/California July 27, touring weapons, bioscience, and materials areas.

(Photo by Randy Wong)

Sandia-sponsored graduate student fellow Katie Moor studies using PDAs to monitor patient nutrition

By Nancy Garcia

A small group of patients will soon use handheld devices to record personal data — their intake of fluids and sodium — in a study led by Katie Moor, a PhD candidate at the University of Indiana-Bloomington, supported by a National Physical Sciences Consortium (NPSC) fellowship sponsored by Sandia.

A summer intern from 2000–2002, she was approached by nurses at Indiana University-Purdue University Indianapolis to create a handheld computer application for dialysis patients to monitor the limited amounts of liquid and sodium they are allowed to consume each day.

Since patients have varied abilities to calculate fluid and nutritional intake, the nurses thought this approach would allow the patients to easily record dietary information and get immediate feedback. They can have only one liter of water and a couple grams of sodium a day. However, some 80 percent of patients are unable to restrict fluid intake, risking hypertension, pulmonary edema, and death.

Normally dialysis patients rely on memory or food diaries. It was hoped that using a handheld computer would contribute to an improved awareness of the relationship between diet and health and reduce social stigma, since the general population is used to seeing people tap on handheld computers.

There are a number of challenges that Moor says she finds appealing in this two-year project, which she begins this fall. She hopes

A summer intern from 2000–2002, she was approached by nurses at Indiana University-Purdue University Indianapolis to create a handheld computer application for dialysis patients to monitor the limited amounts of liquid and sodium they are allowed to consume each day.

to turn it into her dissertation.

First, the user group is expected to have varying literacy rates, dexterity, computer skills, and visual acuity. Also, she will have to develop a way to present large amounts of information on small displays. Technical issues include how to transmit data to doctors and record food items that are not stored in the memory, as well as power-consumption and battery-life concerns.

Moor plans to monitor patient usage for long enough to overcome potentially spurious initial effects. One, the Hawthorne effect, predicts that people will tend to temporarily improve their performance when they are aware they are being studied. Another, the "wow effect," notes that people will modify their use of an application because it is a new toy.

She will be working with patients from the

Indiana University Hospital Outpatient Dialysis Unit in Indianapolis. She plans to spend the first year working with a small group of five patients, training them to try out parts of the application and provide feedback so she can make modifications. Then she will have the proof-of-concept application used by 20 patients and compare their success in monitoring nutritional intake to another group of 20 patients who do not use the device (the control group).

Moor recently submitted a grant proposal on the project to the National Institutes of Health. If the project succeeds, they hope to extend it to other wards associated with Indiana University and potentially to other chronically ill people, such as diabetes patients.

She is intrigued by trying to develop a way to integrate technology into the users' lives, part of her scholastic focus on human-computer interaction and the development of innovative interfaces. At Sandia, she performed network research with mentor Helen Chen (8961), led students creating a proof-of-concept health care sensor system in the Embedded Reasoning Institute under mentors Rob Armstrong and Nina Berry (both 8961), and under Rob, spent the summer of 2002 working with the High Performance Computing Group on a software interface for the Common Component Architecture.

"She's really a success story," Rob says. As an NPSC fellow, she has the option to return to Sandia for a year, and is interested in returning to pursue some engaging research here once her dissertation is complete.

Sandia SAR

(Continued from page 1)

The IFSAR maps have an absolute height accuracy of less than two meters and a relative accuracy of less than one meter.

"This is an order of magnitude precision improvement over the standard USGS topographical maps generally used in search and rescue missions," Dale says.

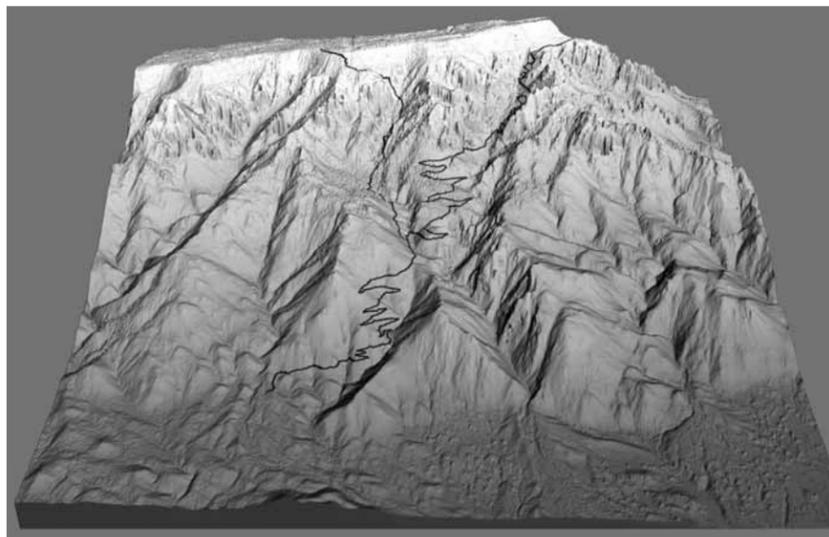
No other mapping system in the world achieves this level of accuracy combined with a high area coverage rate and real-time processing, says Dale. The IFSAR can map day or night and through cloud cover.

It was Dale who provided the map data of the Sandias, obtained while the RTV SAR was installed on a deHavilland DHC-7 Army aircraft. He gave the council a CD of the maps last year.

A few months later, on a chilly November evening, the search and rescue group used the precision maps for the first time.

Steve says he got a call just before sundown telling him that a hiker was lost in the Sandia Mountains, and his help was needed for a rescue.

After collecting additional information on the hiker's location, he took a few minutes to create detailed RTV SAR maps. He zoomed in on



THIS SAR image shows the west face of the Sandia Mountains. Members of the Albuquerque Mountain Rescue Council used detailed versions of it to rescue a man last November.

the area where the man was believed to be and printed out color maps of the location.

Steve then went to the Sandia tram, located on the west side of the Sandia Mountains where the rescuers were gathering, and took the tram up to the peak.

"The hiker was climbing the mountain using the tram cables as a guide for off-trail hiking," Steve says. "He apparently became lost while attempting to follow the tram towers and used his cell phone to call for help. We spotted him from the tram as he waved his flashlight so we would notice him. But seeing him and getting to him were two different things."

The terrain in the area where the hiker was lost is extremely rugged. Members of the rescue group are experts in using compasses, GPS, and topographic maps, but even for them the terrain was difficult to navigate.

AMRC President Bill Scherzinger (9123), who also participated in the rescue mission, says that's when the crew turned to the RTV SAR maps for help.

"The detail available helped us make our way to the man," Bill says. "The maps were color-coded for height and gave estimates of ground roughness. They also distinguished individual rock formations — known to the rock climbers in our group — that are not seen on the topographic maps."

The initial plan was to have rescuers ride the tram to the top of the mountain and then hike down to the stranded hiker's location. However, when they determined that the man was not near the bottom of the canyon, but instead at the top of a ridge called Dragon's Tail, plans changed. The hiker was 100 feet down from the top in a narrow slot that was impossible to access without technical rock climbing.

"Using the RTV SAR maps to help us plan the rescue, we sent one team to nearby Echo Canyon to better determine the exact location of the hiker. A second team went along the treacherous ridgeline of Dragon's Tail. The first

Bruce Berry serves as search and rescue field commander

Another Sandian actively involved in search and rescue is Bruce Berry (4136). He is one of five search and rescue field commanders in New Mexico State Police District 5, which includes Albuquerque, Sandia Mountains, Manzano Mountains, East Mountains, Jemez Mountains, and Clines Corners.



BRUCE BERRY

Each State Police district has at least one search and rescue field commander. The field commanders in the district rotate on-call duties. For example, Bruce is on call 24 hours a day for one week every five weeks.

"Whenever there is a rescue mission needed and I am the one on duty, the State Police call me," Bruce says. "It then becomes my responsibility to determine what resources are appropriate."

He says the Albuquerque Mountain Rescue Council is one of the many tools he uses in missions. He also has access to helicopters, dog search teams, snowmobiles, and horses. When needed, he'll call in the Civil Air Patrol, Air Force, and National Guard.

So far this year there have been 15 missions in District 5 alone and about 68 missions statewide.

Bruce has been involved in search and rescue for more than 20 years. He started out by training search and rescue dogs and later did ground searches and took climbing classes.

Bruce's job at Sandia is equally invigorating. As a member of DoD Security Analysis Dept. 4136, he visits military bases around the country to assess how secure they are from terrorist attacks and other threats. He then makes recommendations for improvement.

team made voice contact with the man from the bottom of the bluffs at about 3 a.m.," Bill says.

The second team rappelled to the hiker at 6 a.m., following a ridgeline that was one of the most difficult and risky routes the rescue group ever attempted. Another four-hour hike using climbing gear and ropes was necessary to bring the man to safety. The entire rescue took more than 12 hours.

"There's no doubt that if we didn't have the RTV SAR maps, reaching the stranded hiker would have been even more difficult than it was," Bill says. "The 3-D detail of SAR maps saved us time while we were planning our route. We expect to continue to use the RTV SAR in future rescue missions where it seems like it will help the most."

Albuquerque Mountain Rescue Council

The Albuquerque Mountain Rescue Council (AMRC) is a volunteer organization that provides a broad range of wilderness search and rescue services to the community. It specializes in technical search and rescue operations in all seasons. Council members train for activities that range from search to technical rope rescue to avalanche rescue.

Bill Scherzinger (9123), organization president, says of the approximately 40 team members, eight work at Sandia. The Sandians are Bill, Steve Attaway (9134), James Freymiller (9125), Craig Johnson (1112), Roy Jorgenson (1642), Mike Lucero (10848), Bill Sweatt (1743), and Neill Symons (6116).

Members are mountain climbers, cavers, and outdoor enthusiasts.

The New Mexico State Police initiates res-

cue missions and turns to different rescue groups for help. Annually the council assists in about 35 missions, ranging from hiking into difficult terrain to rescue someone or using ropes to rappel to a stranded person.

AMRC is a member of the Mountain Rescue Association in the Rocky Mountain Region, which includes teams from New Mexico, Colorado, and Wyoming. The council is a nonprofit organization that relies on donations, primarily through the United Way (where Sandians can donate) and its annual Cabela's sale. The outdoor outfitter, which has stores nationwide and does a heavy mail order business, donates merchandise to the team for fundraising. The Cabela's sale this year will be the week-end of Aug. 28-29.

Coronado Club

(Continued from page 1)

Sandians can enroll in club membership at the Mountain View Club. Members receive \$1 off each individual lunch or dinner meal purchase of \$4 or more, \$2 off all prorated special functions and holiday buffets, dinners, and events, and 10 percent off member personal functions like weddings and receptions, wedding anniversaries, retirement

functions, and birthday celebrations. Club members can also participate in events such as Gourmet Night, a quarterly Membership Night, and Wine Tasting Night.

In addition, members receive a 10 percent discount on goods and services at most service facilities, including the Kirtland Lanes and Tijeras Arroyo Golf Course.

Applications for membership are available at the Mountain View Club or from any of the marketing kiosks seen in most KAFB service activities.

Call 846-5165 for more information.

The 377th Services Squadron also has many other activities to offer Sandians with no dues or membership required. The Tijeras Arroyo Golf Course, Kirtland Lanes, the Kirtland AFB Library, Outdoor Recreation, Skills Development, the Auto Skills Center, Tickets and Travel, and the Motor Vehicle Division are all open to Sandia employees. For more information on facilities or club membership, call the 377th Services marketing department at 846-1644. — Michael Padilla

US-Russian accord seeks global use of nuclear energy

'Considerable common ground,' says Sandia's Paul Robinson, chairman of US delegation

Sandia announced Monday that representatives of seven DOE national labs, including Sandia, and nine Russian scientific nuclear organizations have developed a joint document that advocates greater global use of nuclear energy.

Sandia President and Labs Director C. Paul Robinson was elected chairman of the seven US representatives. "These meetings were held to explore alternative research and development paths to meet growing energy needs," Paul says. "We found considerable common ground on ways to achieve future energy needs, with use of advanced nuclear systems."

US and Russian representatives developed the document July 19-21 at the International Atomic Energy Agency headquarters in Vienna, Austria. The meeting was a follow up to the address by Russian President Putin to the Millennium Summit in September 2000, the Bush-Putin Summit in 2002, and the speech by President Bush at the National Defense University in February 2004. On each of these occasions the idea was advanced that nuclear power should play an appropriate role in the energy mix in the 21st century while providing protection against proliferation.

The document says the participants believe

that of all current or imminently developable energy technologies, only nuclear power is capable of meeting the growing world demand for safe, clean, plentiful, and economically viable sources of electricity, fresh water, and hydrogen.

"The time has come to develop a comprehensive and realistic plan to ensure the development and deployment of nuclear energy," the joint document says. "It must preserve access to nuclear energy sources for all countries of the world, and in parallel, reduce the risks of nuclear arms proliferation, nuclear terrorism, and hazardous impacts on environment and population health."

"With government encouragement and the right regulatory and economic conditions, nuclear energy could supply a substantial part of US and Russian energy needs and 30-40 percent of the world electricity demand by 2050," the document says.

In addition to providing a virtually limitless supply of secure and reliable energy, greater use of nuclear energy would greatly reduce the risk of nuclear weapon proliferation and nuclear terrorism and reduce the worldwide amount of carbon emissions, the directors said.

US, Russian signers of the document

Representatives in the American delegation were Paul Hermann Grunder, director, Argonne National Laboratory; Paul Kearns, director, Idaho National Engineering and Environmental Laboratory; Michael Anastasio, director, Lawrence Livermore National Laboratory; Pete Nanos, director, Los Alamos National Laboratory; Jeffrey Wadsworth, director, Oak Ridge Laboratories, and Leonard Peters, director, Pacific Northwest National Laboratory.

The Russian delegates were Evgeny Velikhov, president, RRC "Kurchatov Institute"; Antoly Zrodnikov, director general, Leypunsky Institute for Physics and Power Engineering, RF Federal Agency on Atomic Energy; Leonid Bolshov, director, Nuclear Safety Institute, Russian Academy of Sciences; Alexander Vatulin, director, Bochvar Russian Research Institute of Nonorganic Materials, RF Federal Agency on Atomic Energy; Boris Gabaraev, director, Dollejal Research and Development Institute of Power Engineering, RF Federal Agency on Atomic Energy; Alexey Grachev, director, Research Institute of Nuclear Reactors, RF Federal Agency on Atomic Energy; Yuri Dragunov, director, general designer, Experimental Design Bureau Hydropress, RF Federal Agency on Atomic Energy; Vital Kostin, director, principal designer, Afrikantov Experimental Design Bureau of Mashine Building, RF Federal Agency on Atomic Energy; Alexander Rimsky-Korsakov, director general, Research and Production Association Khlopin Radium Institute, RF Federal Agency on Atomic Energy.

All of the delegates signed the joint document, which will be submitted to their respective governments for consideration.

Terahertz crystal

(Continued from page 1)

sion. Aided by tiny thermoelectric coolers, it should operate in higher ambient temperatures.

In addition to growing the best THz laser crystals, John grows another type of crystal structure — one of such ultrahigh purity that, at temperatures of 1 K and below, electrons can travel up to 0.1 millimeter in the crystal without scattering. Only four places in the world have successfully grown these structures.

Because only two of these places are in the US, John's ultrapure semiconductor layers are in high demand at universities and "are a centerpiece of the resources being assembled at Sandia's Center for Integrated Nanotechnologies," says Neal Shinn, CINT User Program Manager. John's materials already play key roles in several CINT collaborations.

This material also is being used to develop revolutionary THz detectors, in work again led by Mike Wanke. According to Mike, "Having a grower who can create the structures required for either the lasers or the detectors is incredibly rare, but one able to grow both is amazing."



JOHN RENO

All these gadgets, which weigh almost nothing and whose materials cost will be trivial when scaled up to mass production, use crystals fabricated by John Reno.

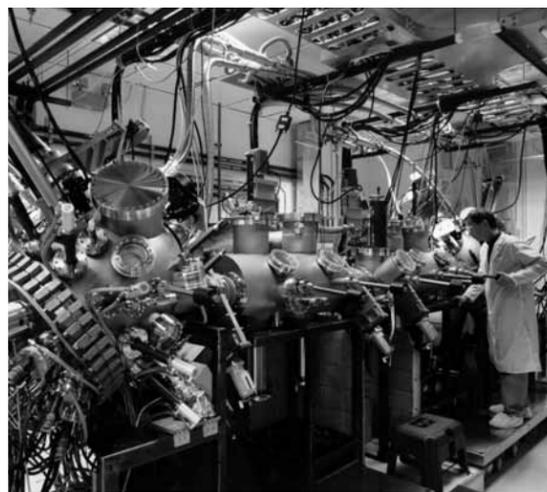
"What's wanted is a solid-state source that is reliable, depends on semiconductor technology, and delivers a reasonable amount of power," says Mark Lee (1123). He says that except for people John has taught, "John Reno is the only grower of semiconductor material in the US who has grown terahertz crystals that work."

What's needed, says Mark, is several milliwatts in continuous output. "John's output of 30 milliwatts at 2.5 terahertz is an order of magnitude higher than any other at that frequency," he says.

How does John achieve this on his aging MBE machine?

"It's not the machine, it's the skill of the person operating it," says Mark. There are, he says, a half-dozen molecular beam epitaxy growers in the US who could deliver as good or a bit better high-purity material.

"Of the other two things that really matter,



THE VERY BEST crystal films for terahertz work in the US are made on a 10-year-old, 10-foot-long molecular beam epitaxy machine in Sandia's Compound Semiconductor Research Lab.

one is precision in layer thicknesses; equally important is alloy precision. John has been tuning his machine for years." Nobody in the US does it better, he says.

To see bearded John at work in his lair — gowned, booted, gloved, masked, and capped, facing a 10-foot-long, seven-foot-high, molecular beam epitaxy machine — is a stirring sight. John is as suited as any armored knight facing a dragon.

On his commands, the MBE's black electrical wires, thin silver tubes delivering nitrogen, thick cylindrical cooling pumps, and still-larger arm of an electron beam gun all work together to deposit atoms, atomic layer by structured atomic layer.

John's position is so central that in the strange deck of cards called the Tarot, whose face cards are claimed to represent archetypal human situations — the Hanged Man, the Empress, the Huntsman and so on — John might be a new archetypal entity . . . the Crystal Grower.

But not, obviously, of the glitzy kind hawked by merchants in Santa Fe. THz sources based on semiconductor crystals have been achieved at very few other sites in the world — among them, the Cavendish Lab in England and the University of Neuchatel in Switzerland.

Each crystal for terahertz lasers takes approximately 17 hours to grow and is composed of 175 "steps," so-called because the declining energies at each step resemble a set of stairs going downhill. Indeed, this type of semiconductor laser is called a "quantum cascade laser," since the electrons act like water as they "cascade" down the steps, emitting a THz photon at each one. These

steps consist of about 10 layers built of different thicknesses and materials, each composed of five to 35 atomic layers. John can grow one crystal each day.

The amount of care resembles that taken by a Japanese blacksmith forging a classical samurai ceremonial sword, rearranging and elongating his material's crystal domains by continual refolding. "The process has to remain the same, whether after five hours or 17 hours, or the quantum levels [of the materials] change," says John. The work requires the opening and closing of precise shutters, he says.

To do this, he heats and boils off potentially dangerous materials like arsenic, gallium, aluminum, and indium at roughly 1,100 degrees C, and allows them to coalesce as a crystal film on a mirror-smooth gallium arsenide substrate, 625 microns thick, at nearly 600 degrees C. The work must be accurate down to the atom.

"Some sites are gallium surrounded by four arsenic; or an arsenic surrounded by four gallium," John says. "Different metals are different distances apart." A deposited atom has to have time to find a home before being barraged by new atoms, he says. "They need to be given the right amount of energy to move on this hot surface."

John sees himself as facing two challenges. One is the chemical/mechanical challenge to put what he wants into, say, four atomic layers.

The second challenge is the precise growth that will produce the desired output. For that, he says, he relies on researchers to provide him with a working set of specifications to build to.

The specifications are in, and more are on their way.

Whooshssshhh

Sandia Rocket Sled Track zooms through its first 50 years; team looks forward to another half century on the fast track

By Bill Murphy

When retirees and current staff of Sandia's Rocket Sled Track operation gathered in Tech Area 3 in late July to celebrate the facility's 50th anniversary, they heard retiree Paul Adams share his eyewitness account of the track's first test.

Paul, one of a couple of dozen retirees who joined in the anniversary celebration, allowed as how, 50 years on, he doesn't remember much. "Those of you who are more than 50 years old will understand my quandary," he said.

But Paul did remember enough to share this: "The first test was a fairly low-speed test. It was an impact test on a bomb nose to check out the contact fuzes. Those few of us who were here watched it from the guard tower down by [Bldg] 6540 — that was the main control spot for the sled, the centrifuge, and the vibration facility. The sled got about three quarters of the way to the target and the front shoes failed. After that, [the sled] was airborne."

He paused, and with a wink and a nod, and to general laughter, added, "I don't think there have been any failures since!"

As he looked over the audience of retirees and on-roll employees, Paul continued, "Most of you I don't recognize it turns out I hired, so I apologize for all that. . . . Fortunately for him, the guy who hired me is dead, so he's off the hook completely. Since I hired a lot of you who are still here, I'm not off the hook yet, so you'll just have to do the best you can." (Paul is in the photo at right, in the plaid shirt, standing in front of a large-screen projection of a rocket sled test with fellow retiree Fred Brown, who was also present for the first test in 1954.)

Mechanical Environments Dept. 9134 Manager Steve Hefflefinger, who oversees several large-scale testing facilities including the sled track, recalled how the stage was set for the birthday party. "About a year ago, I was going through my cabinet looking for a document and I came across the logbook for the sled track for tests numbers 1 to 501. I opened it up to the first page and the date on it was July 28, 1954. That was our first sled test that was recorded at Sandia, and I thought, boy we've got to have a party — and this is the result of that."

Tom Bickel, Director of Engineering Sciences Center 9100, lauded the work done at the track over the past 50 years and cited its importance to Sandia's mission.

"Area 3 and the sled track in particular," Tom said, "have been instrumental in our ability to supply the information to assure the safety, the security, and the reliability of the nuclear stockpile. The folks who are here today developed a lot of that knowledge. And for that, Sandia says, 'Thank you.'"

"We are moving into a new regime now. We have evolved over the past years from a test-only based approach to a test approach with computation, and we continue to provide challenges to a new staff out here who are a lot younger than I am."

As is appropriate for anniversary celebrations, it was a day for



reminiscence. Tom recalled that on his first day on the job at the Labs, his very first phone call was from someone who said, when Tom picked up the phone "Where do you want your fire engine?" And I'm thinking, I've only been here one day and they're already giving me my own fire truck! This is gonna be a great place to work!"

It turned out the call was supposed to be for Dave Bickel (no relation), who was running a test at the sled track and had requested an extra fire truck for safety purposes.

"The bad news is," Tom concluded, "I had a runaway foamer on my property books for about another 15 years."

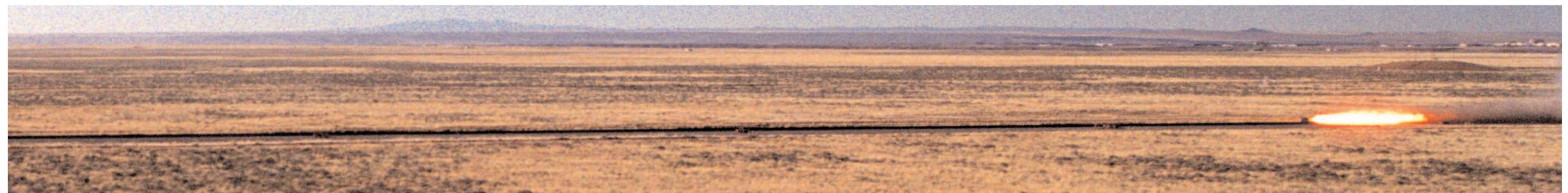
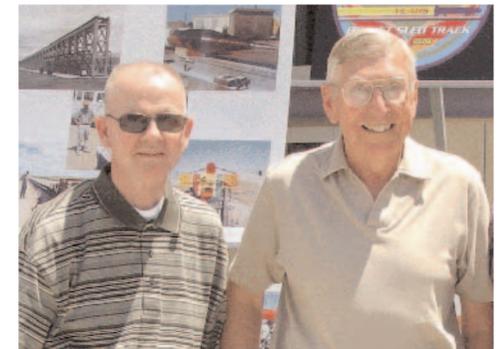
And speaking of Dave Bickel, he managed the track for a total of 22 years during the time period of 1963 to 1994. Dave recalled several of the major milestones of the track's history, including the big test in which a tractor-trailer was collided with a locomotive diesel engine. That test, designed to measure the survivability of shipping containers in catastrophic events, was quite a demanding setup, Dave said, and generated considerable interest. Some 600 people showed up to watch it, and the event was covered on television by the major news networks. He also took note of the famous F-4 test, in which an F-4 fighter aircraft was slammed into a massive, instrumented concrete block at 750 feet per second to estimate the effect of a crash into a nuclear power plant containment building. The video of that test has been widely used — and misused — for the past 15 years. (In the photo at far right, Dave Bickel, right, stands with Bill Kampfe, who was the track's chief test engineer from 1959 to 1995, when he retired as a DMTS.)

Tom Bickel left the retirees with an invitation — and a challenge.

"Don't be strangers to us out here," he said. "I know how much knowledge is resident between the ears [of you folks]. As much as we like to think we know everything nowadays, and that computers will solve every problem, that's not the case, so I'm always looking for a few good ideas — and those are not discriminated by age."

SANDIA'S ROCKET SLED TRACK FACILITY in Tech Area 3 provides a controlled environment for high-velocity impact, aerodynamic, acceleration, and related testing of small and large test items. Tests can be designed to simulate unique scenarios and to provide the maximum data from each test. The facility provides a 10,000-foot track for testing items at very high speeds and a 2,000-foot railroad gauge track for testing very large items. The combination of ingenuity, experience, and instrumentation available at this facility makes it unique for research, test, and evaluation purposes.

The Rocket Sled Track has a large suite of advanced instrumentation capabilities. The facility uses photometrics, laser trackers, telemetry, and hardwire systems to gather data from a variety of instruments and transducers. Time-space-position information (TSP) can be acquired at up to 1 KHz with 1-foot accuracy, and transducer data may be sampled at up to 1 MHz. High-speed video, flash x-ray, and film cameras running 40,000 frames per second and higher are available. Hardened data recorders, for use on board sleds or test items, are also available for test purposes.



Spaced-out Sandia stores square feet in 'space bank'

DOE policy requires foot-for-foot match between construction, demolition; some older projects exempt

By John Zavadil (10870)

In 2002, Sandia opened a new bank. Not a typical bank, but one holding something that's become almost as precious as gold at Sandia — space.

If you've tried to get any new office or laboratory space lately, you've probably found out the hard way that Sandia is suffering from a severe shortage. Of the more than 6 million square feet at the various Sandia sites, only about 50,000 square feet is vacant, in small chunks scattered among several buildings. Several new construction projects are underway, but those buildings have already been promised to future occupants. Sandia needs a lot of space to meet growing mission needs, particularly to support national security initiatives, but the space isn't available.

Why doesn't Sandia just go out and build all the space it needs? Aside from the more obvious reasons (funding, DOE sponsorship, etc.), Sandia has to comply with a

new congressional mandate. In an effort to get rid of substandard DOE buildings, Congress now requires DOE to keep careful track of any space added or removed from its sites. Except for leased space, all new square footage — a large office building, a mobile office, or even a guard shack — must be balanced by the removal of an equivalent amount of space, either by demolishing buildings, removing mobile offices, or transferring buildings to other government organizations. The goal is zero net growth for the entire DOE complex. DOE has decided to implement the requirement by having each DOE site track its own space, so every time Sandia builds new space, we have to get rid of the same amount of substandard space.

So how is Sandia handling this challenge? That's where Whitney Wolf (10854) comes in. She's the manager of the Sandia space bank. Any eliminated space, like the recently demolished Bldg. 841, is credited in the bank and applied to offset new construction projects. Whenever Sandia asks NNSA to authorize a new construction project, Whitney must identify the buildings that have been or will be removed to offset it. In some cases, particularly

for larger projects, the offset buildings identified will not actually be removed for several years. This is fine as long as the space is removed before the new space is occupied.

It's not easy keeping the bank up to date, because most Sandians don't know about it. Whitney often gets calls from a building manager who's noticed a new shed that's popped up in some remote location. Other projects that were accounted for in the bank experience "scope creep" and end up building more square footage than originally expected. "We want to make people aware of the offset space requirement so they don't inadvertently affect other projects," says Whitney. "I'm not telling anyone they can't buy a shed or build more space, but if they do, I need to know about it."

Whitney has been banking demolished space since 2002, adding almost 175,000 square feet to date. That may sound like a lot, but Sandia is starting to feel the squeeze. So far, the banked space has mainly been used to meet immediate needs (small buildings like Bldg. 752, building additions, etc.), but the new Center for Integrated Nanotechnologies, which just broke ground (*Lab News*, June 11), will use almost 100,000 square feet when it's occupied.

Several more large projects are in the works. So much new construction is planned that the bank is projected to go negative in December 2005, which could threaten or halt Sandia's construction programs. This deficit could increase to almost 400,000 square feet in 10 years, and that's assuming all planned demolitions and projects will be completed on schedule. Any delays in demolition, increases in square footages of planned new construction, unexpected space purchases, or additional new construction projects will only exacerbate the problem. In the worst case, DOE could stop construction on a project needed to meet a critical mission requirement until Sandia can offset the space.

More demolition is also planned, but in an example of "no good deed goes unpunished," Sandia's excellent, proactive demolition program has already eliminated most excess facilities. The program removed more than 360,000 gross square feet of substandard space before the offset requirement was implemented, and Sandia's only excess facility, Bldg. 805, has just been demolished. Sandia has identified additional facilities that need to be demolished because they have exceeded their useful life, but most of these buildings are occupied. It's a Catch-22: we need



TIT FOR TAT — Bldg. 805 was demolished this summer. Its demolition allows for another building to be constructed, following a congressional mandate to DOE.

Several more large projects are in the works. So much new construction is planned that the bank is projected to go negative in December 2005, which could threaten or halt Sandia's construction programs.

space so we can move people out of substandard buildings that we want to demolish, but we can't build new space to house those people until their current buildings are demolished.

In addition, NNSA has recently ruled that space eliminated with NNSA funding resources can only be used to offset new NNSA space. CINT, an Office of Science project, was the one exception to this, and NNSA has made it clear that CINT was not a precedent.

The news isn't all bad. Again, leased space doesn't count, currently. And projects that were approved before 2003 are exempt, including the massive Microsystems and Engineering Sciences Applications Complex (MESA), the recently occupied Joint Computational Engineering Laboratory (JCEL), the new Distributed Information Systems Laboratory (DISL) at Sandia/California, and several smaller new buildings. To the best of our knowledge, new construction for the Department of Homeland Security (DHS) is also exempt. Sandia's space management group is examining alternatives for acquiring space, such as on- and off-site leasing. And if the space bank does run dry, Sandia will have to petition NNSA to waive the requirement for new projects that address critical mission requirements. This won't be easy — all indications show that the Secretary of Energy must approve all waivers. Sandia can also borrow space from other DOE sites, and we are currently negotiating with the Nevada Site Office to acquire 200,000 gross square feet of their demolished space, but even that will only offset new construction through 2009, based on current plans.

What can you do?

- Contact your space coordinator if you plan to add or remove any space, even a storage shed. (Not sure who your coordinator is? Go to www-irn.sandia.gov/facilities/realestate/space_coordinators.htm.) The coordinator can help you explore the alternatives available to you and will contact Whitney, who will be able to keep the bank up to date.

- If you are constructing new space, make every effort to avoid "scope creep" and to keep your project's square footage at the initial approved size.



BLDG. 6584 in Tech Area 3 was completely remodeled, almost from the ground up. As a remodel, however, it did not add new square footage to Sandia's total available space. As such, it does not count as new footage in the "space bank."

Sandia's CMC celebrates 10th anniversary



CMC's 10th — German Smirnov of the All Russian Research Institute for Automatics, Russia (left photo), addresses a crowd with help from Sandia interpreter Elena Bloomstein of International Science & Technology Dept. 6927. The July 29 gathering at Sandia's International Programs Building celebrated the Cooperative Monitoring Center's 10th anniversary (*Lab*



News, July 23), which began with a series of presentations and ended with an afternoon open house. In the right photo, Gidi Netzer, left, an Israeli defense and security consultant, discusses international policy issues with Michael Vannoni of Regional Security and International Affairs Dept. 6924. (Photos by Bill Doty)

Feedback

Q: *Tech Area Maps: Although I have been a Sandian for more than 10 years, I infrequently have to go into Tech Area 1 and more often than not find myself lost amongst the changing gate/fence patterns, new construction, and multitude of MOs and T-buildings. This has forced me to be late several times for training and meetings even after I think I have reviewed the maps posted on the Sandia website. Why can't there be maps/directory within the technical areas to help identify where you are and where the major buildings/streets are located? This may not seem confusing for the residents of TA-1 but is frustrating for other Sandians like myself.*

A: New employees and people who have not been in our technical areas or remote sites for a while can certainly feel lost in the "City of Sandia." As you so adequately pointed out, the physical infrastructure and configuration of our technical areas are constantly changing and can be difficult to navigate. Right now there are no plans to install directories to locate buildings in the technical areas or other sites. TA-1, TA-4, and remote areas have numerous entry points so we would need multiple directory locations, similar to the multiple directory locations commonly found in shopping malls.

The cost to maintain the accuracy of the directories would be high due to the frequent changes with limited benefits derived. There is still hope. The following web sites on the SRN can provide you with the information you may need: from the Sandia home page you can access maps through the icon in the lower right side of the page or visit the following links: <http://www-irn.sandia.gov/2nd-levels/maps-frame.html> and <http://www-irn.sandia.gov/2nd-levels/maps-links.html#snl/nmtechareas>. You can access the following link to get information on construction projects that will interrupt pedestrian or vehicle paths: http://www-irn.sandia.gov/facilities/esh/traffic_const/trafficmain.htm.

You may also visit the excellent Traffic Safety Committee home page and link to various other informational sites on traffic work at: <http://www-irn.sandia.gov/facilities/esh/traffic.htm>.

I would also encourage you to read the *Sandia Daily News*, as most major traffic impacts and area changes are published. Another excellent source of information about major road closures is the Incident Commanders Nightly Report. Hopefully these information sources will allow you to reach your destination quickly and on time.

— Lynnwood Dukes (10860)

Q: *With US health care costs projected to rise to a staggering \$2 trillion dollar level by 2007, what is Sandia's long-term plan, other than passing along more and more of the cost to the employees, to promote employee fitness? Increasing employee fitness is one of the most cost-effective ways to lower health care costs. Example: Union Pacific Railroad invested \$2.5 million dollars in workplace wellness and reported a same year \$50 million healthcare cost decrease as a result. Not to detract from what Sandia has done in the past and is currently doing, many employers have no fitness program(s) at all, but Sandia could and should do better. Ironically, I type this in my organization's building which has an exercise room sans exercise equipment.*

A: Sandia has supported an onsite, preventive health initiative for more than a decade when the concept of corporate wellness was in its infancy and prior to today's trend of upward spiraling health care costs. Since its inception, ¡SALUD! Health Promotion has had wide acceptance with great employee participation rates despite the lack of an adequate facility. The absence of exercise and teaching space necessitated creative delivery solutions but never deterred ¡SALUD! from providing innovative preventive services or from demonstrating that prevention is indeed more cost effective than entering the health care system for the treatment of disease. Now, in an age of rising health care costs, informed consumerism, and epidemic disease, the contrast between managing modifiable risk factors versus treating diseases with severe complications is much clearer to contemporary corporate culture. Simply put, the difference in encouraging employees to be ever vigilant of their personal health versus treating those already suffering from the consequences of disease is more boldly highlighted by the escalating health care costs we presently endure.

At the beginning of this decade, Sandia's Health Services Center developed a programming strategy tailored to the present and future needs of our populations and aligned with Healthy People 2010 (<http://www.healthypeople.gov>). We looked at the leading health risk indicators at Sandia and how to proceed in influencing the health outcomes of those covered by our health care plans. We also looked at the accessibility and delivery programs. We developed an integrated organization and brought together a multidisciplinary staff of health educators, dietitians, fitness professionals, doctors, behavioral specialists and experts from the community.

Our health care team then developed a rich strategy with the singular mission to prevent pre-

mature morbidity and extend a high quality of life to Sandia's populations. This strategy has since and is presently being rolled out.

Here are just a few directions that Sandia's Health Center's present strategy has taken:

- Last year, CA ¡SALUD! opened its Life Design Center, which is a fitness and health education facility.

- NM ¡SALUD! and the Employee Assistance Program moved to a new 7,000 sq. ft. mobile with an exercise room, assessment and teaching space, and staff offices. (See <http://www.sandia.gov/health/update/lrcblog.html>.) This building was supported by IES monies and represents Sandia's recognition of the importance of enabling workplace accessibility to exercise, health education, and counseling services.

- An innovative Disease Risk Management Clinic (DRMC) piloted a diabetes program in July 2001. "Compelled by scientific evidence demonstrating that many diabetes complications are preventable with education, diet, exercise, and new pharmacological approaches, the Health Services Center formalized a disease management plan." It's at <http://www-irn.sandia/HR/health/manager/diabetes.htm>. Here, we found that in implementing high standards of care and making it easy for participants to adhere to recommendations through workplace accessibility, we could achieve amazing clinical outcomes, cheaper and faster than commercial diabetes programs.

- This year, we are applying the lessons learned from the Diabetes Pilot to broaden the DRMC mission to include other prevalent diseases that plague our populations, such as hypertension and high cholesterol. We will likely expand the DMRC even further to manage obesity.

- We have, for some time, recognized that the health of any Sandia employee affects that of his/her coworkers, spouse, family, and community whether presently on-roll or in retirement. Therefore, we have revamped our spouse and retiree programs, making them more robust. We've made our same workplace services conveniently available in the community. <http://www.sandia.gov/health/update/community.html>

Moreover, we have solid communications channels wherein we use target messaging to attract interested populations. And, we continue to promote on larger scales through our 15-year-old newsletter, which has some 10,000 subscribers and to centralize our customer service components. We hope you will feel free to visit us @ <http://www.sandia.gov/health/update/> or to direct your queries to health@sandia.gov or (505) 844-HLTH (4584). — Larry Clevenger (3300)

Mileposts

New Mexico photos by Michelle Fleming



Ronald Jacobson
40 6211



John Hohimer
30 11500

Recent Retirees



Thomas Stueber
25 5733



Marti Mohr
30 5701



Rosemary Baca
25 42231



Vance Behr
25 5932



Michael Coltrin
25 1126



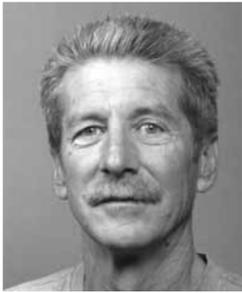
Linda Gonzales
25 6325



Mary Moya
25 5531



Douglas Salmi
25 1733



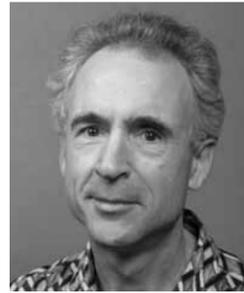
Larry Whinery
25 2111



John Wronosky
25 2339



Edward Archibeque
20 10268



Richard Beauheim
20 6822



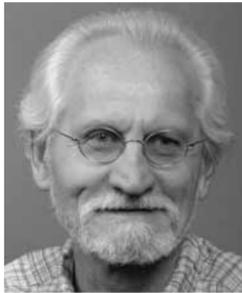
Barry Boughton
20 9116



Richard Diver
20 6218



Douglas Hodge
20 2997



Franz Lauffer
20 6321



John Pott
20 9123



Randy Rembold
20 5736



Charles Schaub
20 6923



Dale Shamblin
20 9134



Fred Silva
20 10263



Robert Tachau
20 15322



Stephen Walcott
20 6322



Gregory Hebner
15 1118



Michael Hess
15 5523



Christopher Hogg
15 5526



Hue-Su Hwang
15 6321



Deanna Jaramillo
15 1637



Scott Klenke
15 9125



Anne Moats
15 9117



Michael Rightley
15 1745



Edward Sanchez
15 10826



Thomas Tarman
15 9336



Brenda Townsend
15 12345



James Wifall
15 2912



Timothy Wiseley
15 2994



This month in the past

This monthly column highlights Sandia Lab News items from 50, 40, 30, 20, and 10 years ago, but each column does not necessarily include items from each decade.

40 years ago . . . The Aug. 16, 1964, issue reported that Sandia employed about 7,100 persons in FY64, up about 100 from the previous year. (The Labs has about 8,300 employees today.) That issue also included a hard-hitting editorial opposing littering. And a group of Sandians was reported working near Hattiesburg, Miss., helping prepare for a five-kiloton, 2,700-foot-deep underground nuclear detonation designed to develop techniques for improving the capability to detect, identify, and locate underground nuclear explosions. The detonation — part of “Project Dribble” — took place soon thereafter, making Mississippi one of only five states to ever “host a full-scale nuclear test.” (*Name all five and you may qualify to challenge that celebrated Jeopardy hotshot!)

30 years ago . . . The Aug. 2, 1974, *Lab News* featured a patented new fast-shutter, large-aperture camera system invented by Sandia/California’s Art Van Hook and Gene Neau that used empty beer cans as magnetically driven shutter closure devices.

The article did not explain who drained the cans or where that took place, but both researchers looked pretty mellow in the accompanying photo.



ART VAN HOOK, right, and Gene Neau with their famous beer can camera.

20 years ago . . . Sandia’s brand-new Technology Transfer Center (Bldg. 825), scheduled to open and be dedicated the following month, was featured in the Aug. 3, 1984, issue. The 14,000-square-foot building gave Sandia/New Mexico its first top-notch meeting facility that would accommodate groups of nearly 500. It proved a wise investment (total design and construction costs were \$2.1 million), continuing today as the place for large Labs meetings. The Aug. 17 issue featured another new Sandia facility, but one that was “doomed” from the start — a 30-foot-tall, one-eighth-scale model of a nuclear containment building typical of those surrounding light-water reactor nuclear power plants. It was soon overpressurized “to failure” to validate computer codes for predicting behavior of nuclear containment buildings during severe accidents.

10 years ago . . . The Aug. 19, 1994, *Lab News* announced that former space shuttle astronaut and Air Force Col. Sid Gutierrez, who had accumulated nearly 490 hours in space on two shuttle missions, would join Sandia Aug. 29 as Manager of Strategic Program Development. Today Sid is Director of Systems Research Center 5900. — *Larry Perrine*

*Five states where full-scale nuclear tests have taken place: Alaska, Colorado, Mississippi, Nevada, and New Mexico.



Family Day delayed until 2005

Sandia Family Day/NM, originally scheduled for Sept. 18, and Family Day/CA, scheduled for Oct. 9, are being postponed until spring 2005. Family Day planning will continue, and a new date will be announced later this year. For additional information, call Family Day/NM co-chairs Mike Lanigan, 844-2297, or Debbie Johnson, 844-3570, and in Calif., Mike Janes, 294-2447.

New owners get keys to latest Habitat for Humanity House



EDUARDO PRIETO receives the traditional hammer from Stan Hall, 9623, on behalf of the Sandia volunteers. It is a symbol of the sweat equity his family put into their home (500 hours) and the volunteer work on the Habitat for Humanity house (estimated at 2,300 hours and 275 volunteers). With Eduardo is his wife Maria and children Senica, 11; Walter, 10; and Crystal, 4. (Photos by Bill Doty)



THE PRIETO family stand proudly in front of their new home as volunteers add the finishing touches. They were able to celebrate the Fourth of July in their new home.

Recent Patents

Samuel Miller (5917), Paul McWhorter, M. Steven Rodgers, Jeffrey Sniogowski, and Stephen Barnes (all MEMX): Microelectromechanical Apparatus for Elevating and Tilting a Platform.

Armin Doerry (2342): GMTI Motion Compensation.

Albert Baca (1742), Carol Ashby (11500), Nein-Yi Li, and Hong Hou (both Emcore): NPN Double Heterostructure Bipolar Transistor with INGAASN Base Region.

Scottie Walker (6952): Thermoluminescence Dosimeters with Narrow Bandpass Filters.

David Haaland (1812): Hybrid Least Squares Multivariate Spectral Analysis Methods.

Jack Houston and William Smith (both 1114): Laser Interferometry Force-Feedback Sensor for an Interfacial Force Microscope.

Steve Haney (8245) and Michael Malinowski (8751): Portable Outgas Detection Apparatus.

Stewart Griffiths (8350) and Robert Nilson (8752): Method and Apparatus for Reducing Sample Dispersions in Turns and Junctions of Microchannel Systems.

Patrick Doty (8772): Boron Nitride Solid State Neutron Detector.

Steven Goldsmith (5517): Adaptive Method with Intercessory Feedback Control for an Intelligent Agent.

LANL’s Toni Taylor named CINT associate director

Antoinette (Toni) Taylor, a scientist at Los Alamos National Laboratory, has been named Associate Director for the Center for Integrated Nanotechnologies, CINT Director Terry Michalske (1040) has announced.

CINT is a joint venture between Sandia and LANL, funded by DOE’s Office of Science. It operates as a national user facility for the design, performance, and integration of nanoscale materials.

Taylor is internationally recognized for her scientific accomplishments in the development and application of nanoscale probes. She has more than 170 refereed publications to her credit. At Los Alamos, she has served as a Scientific Thrust Leader for Complex Functional Nanomaterials. Her contributions to CINT have helped define the user program and she has played a key role in building the joint Sandia/Los Alamos scientific community.

“We welcome her formally aboard in her new role,” said Terry.